

L Number	Hits	Search Text	DB	Time stamp
1	703	mmse (minimum adj means adj square adj error)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/07/07 16:38
2	26166	equalizer	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/07/07 16:39
3	169	(mmse (minimum adj means adj square adj error)) same equalizer	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/07/07 16:39
4	98	(mmse (minimum adj means adj square adj error)) near3 equalizer	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/07/07 16:44
5	6	soft same ((mmse (minimum adj means adj square adj error)) near3 equalizer)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/07/07 16:40
6	7	((mmse (minimum adj means adj square adj error)) near3 equalizer) same advantage	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/07/07 16:44

US-PAT-NO: 5761237

DOCUMENT-IDENTIFIER: US 5761237 A

TITLE: Method and apparatus for
multiuser-interference
reduction

3,419,112

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Detailed Description Text - DETX (62):

The linear MMSE multiuser equalizer, in accordance with the present invention, can be implemented as a network of, $K \times K$, T-spaced equalizers, or as a bank of K fractional-chip spaced equalizers. In the latter case, there is no need to explicitly implement the despreading function separately. The fractional-chip spaced equalizer has the property of synthesizing both the despreading and the equalizing functions. The practical advantage of MMSE equalizers is that they lend themselves to simple adaptive implementation. Thus, for a fading channel and unknown cross-correlation functions, standard adaptation algorithms can be applied. The adaptation algorithms can operate in reference-directed or decision-directed mode. In environments where the channel changes very slowly relative to the symbol rate, it will be easier for the equalizer to track the variations. In rapidly changing environments, additional techniques such as channel sounding may be necessary. However, note that a multiuser equalizer does not invert the channel frequency response but rather the spectrum of the correlation matrices which are formed from the different spreading codes. Hence, in this regard the tracking problem of a

multiuser equalizer should be in general easier than the tracking problem of a conventional single-input single-output equalizer over a fast-fading frequency selective channel.

US-PAT-NO: 6314147

DOCUMENT-IDENTIFIER: US 6314147 B1

TITLE: Two-stage CCI/ISI reduction with
space-time processing in TDMA cellular networks

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Brief Summary Text - BSTX (13):

One class of receivers use minimum mean-square error (MMSE) criteria to provide an equalizer that reduces CCI and ISI simultaneously, such as space-only and space-time MMSE receivers. These receivers are well-known in the art and are fairly robust to CCI. However, this class of receivers implement symbol-by-symbol decision, and therefore, they are not optimal for ISI which spreads the information content of the received signal accross several symbols. Besides, they suffer from noise enhancement inherent in the MMSE approach due to channel inversion. The second class of receivers that treat CCI as noise use time-only or space-time minimum mean-square error decision feedback equalizers (MMSE/DFE). This class of receivers can perform adequately at a high signal-to-interference-plus-noise ratio (SINR). However, catastrophic error propagation can appear when the CCI is strong or when the received signals are in a deep fade. A third class of receivers that treat CCI as noise implement MLSE-based algorithms which include spatial-whitening/Viterbi and spatial-temporal-whitening/matched filter/Viterbi equalizers. The main advantage of this class of receivers is that they effectively combat ISI without producing noise enhancement

or error propagation. However, the covariance matrix of the CCI must be known. All three classes of receivers described above require either accurate estimation of channel information or the covariance matrix of CCI plus noise. However, in practical situations, the presence of severe CCI impairs the accuracy of estimation of these parameters, and hence the receiver performance. It is therefore desirable to provide a digital receiver for a TDMA network which provides improved estimation of the desired symbols in a received signal that includes the desired symbols, CCI, ISI, and noise.